

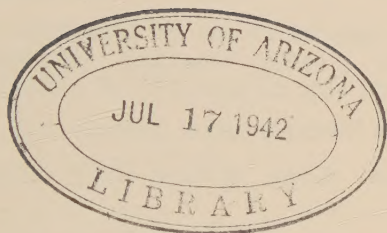
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Substitutes

For Concord Grapes

In Oklahoma

By **FRANK B. CROSS** and **J. E. WEBSTER**



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Concords Fail to Ripen Evenly

Although the Concord grape is the most popular commercial variety in the United States, it has proved undesirable in much of the Southwest, including a large part of Oklahoma. In these areas, the market value of the fruit is often ruined because at harvest time a large proportion of the grapes on each cluster are still green although other grapes on the same clusters will be fully ripe.

Much research has been done by the Oklahoma Agricultural Experiment Station in an effort to find some cultural practice which will assure even ripening of Concords in Oklahoma vineyards, but no such practice has been found. The results of numerous tests indicate that, in regions where Concords do not color evenly, they must be replaced with other varieties adapted to the region.

Recommended Varieties

Grape variety tests conducted by the Oklahoma station and observations of producing vineyards indicate that the following varieties are suitable for planting in this state:

Moore Early. Black, fair quality, early, vine not vigorous.

Campbell Early. Black, good quality, early, vine not vigorous.

Seneca. White, good quality, early, good market grape.

Lucile. Red, large, fair quality, productive.

Beacon. Black, large cluster, shatters, very productive.

Delaware. Red, small, very good quality.

Bailey. Black, large cluster, productive.

Niagara. White, large clusters, productive, good quality.

Extra. Black, compact clusters, productive.

Muench. Black, small berries, productive.

* Department of Horticulture and Department of Agricultural Chemistry Research, respectively.

Catawba. Red, good quality.

Goethe. Red, productive, fair quality, very late.

Comments on Varieties

The foregoing list includes varieties which are desirable for table use in a fresh condition, and also heavier producing varieties not so suitable for table use but desirable for the production of large quantities of grapes for making juice, jams, jellies, etc. Those classed as high quality table grapes are Seneca, Delaware, Niagara, Catawba, Goethe, Campbell Early, and Moore Early. Those in the class designated as of lower quality but heavier producers are Beacon, Bailey, Extra, and Muench.

Campbell Early and Moore Early are old varieties which have been extensively planted throughout the State. The Moore Early is similar to Concord, but ripens from two to three weeks earlier. It ripens much more evenly than the Concord. The Campbell Early is of high quality and attractive appearance wherever it can be grown successfully. It is partially self-sterile, and requires pollination for the production of full clusters of fruit. Campbell Early and Moore Early are poor growers and should, therefore, be planted only in fertile soils adapted to grapes. In such favorable locations, they are very desirable varieties.

Replacing Undesirable Varieties by Grafting

Concords and other undesirable varieties of grapes may be successfully grafted to more desirable types. This work should be done rather early in the spring, just before there is any upward movement of the sap. This will usually be during February or early March, depending on the section of the state in which the vineyard is located. The cleft graft is the usual method followed.

The scions should be taken from the parent vines sometime during the dormant season and stored in a cold place, protected in such a manner as to prevent their drying out, that is, loss of moisture. If buried in a trench, covered with six to eight inches of soil, they should keep perfectly until time to use them. The scions will vary in length, but should have from two to three buds. The lower end of the scion should be cut to a wedge shape, beginning as close to the basal bud as possible. The bevel should be $1\frac{1}{2}$ to 2 inches in length, and the wedge shape should be secured by cutting from both sides of the scion. Two scions are usually inserted in each stock, one on either side of the cleft in the stock.

The scions should be inserted in the stock two or three inches below the ground level. The stock should be cut off at that level with a saw, after having removed the soil from around the plant. The stock should then be split with a sharp knife or cut vertically with a saw to a depth of $1\frac{1}{2}$ inches and at right angles to its length. Use of a wedge opens the cleft so that the prepared scions may be inserted, one on either side. These scions should be inserted with the basal bud pointing outward from the stock, and in such a manner as to bring the portions just under the bark (cambium) of the scion and of the stock into direct contact with each other. If the stock has been properly prepared, the natural "spring" will hold the scions tight. If it has been split or cut to too great a depth, this will not be the case, and it may be necessary to tie the two halves of the stock with a string in order to hold the scions in place. This should be avoided as much as possible. After the scions have been thus placed, paper should be wrapped around the stock and scions, covering them as with a cylinder placed vertically. Soil should then be mounded over the stock and scion so that the topmost bud of the scion is level with the surface of the soil.

If the work is carefully and properly done, using good material and skill, a new top sufficient to produce a normal grape crop, may be expected within one year. In order to produce a top of this nature, which will in turn produce a full crop of grapes the second year after the grafting operation, it will be necessary to carefully train the shoots developing from the scions upon the trellis. This method of training is explained in detail in Oklahoma Extension Circular No. 254, "Grapes in Oklahoma."

Uneven Ripening Associated With Low Sugar Content

The failure of Concord grapes to ripen evenly under Oklahoma conditions appears to be associated with the low sugar content of the fruit of this variety. Extensive chemical and physiological studies of the vine and foliage have failed to show any abnormalities in Concord grapes that would account for the low sugar content; and numerous cultural experiments have failed to affect the uneven ripening.*

Among the cultural practices tried were nitrogen and phosphorus fertilization, irrigation, providing additional light, shading the plants, artificial cooling of the plants, leaf pruning, girdling, and bagging of the ripening fruit.

* Detailed results of this work are presented in Oklahoma Station Technical Bulletin No. T-13.

Superphosphate fertilizer did not improve coloring. Nitrogen fertilizer improved it somewhat, but not enough to be of practical value.

Sub-irrigation during and preceding coloring gave the smallest percentage of colored berries found in any of the treatments.

Providing additional light failed to improve coloring; and various shading treatments markedly lowered the percentage of colored berries.

None of the other treatments had enough effect to make their use practical.